LISTING OF CLAIMS:

The following Listing of Claims supercedes all previous claims listings.

1. (Cancelled)

2. (Currently Amended) The apparatus according to claim 34 [[1]], wherein the input correction portion ~~control unit~~ outputs the first correction value and the second correction value ~~control signal~~ based on the target value, wherein the target value is either of an amount of bending and an amount of rotating of the subject.

3. (Withdrawn) The apparatus according to claim 1, wherein the control unit outputs the control signal based on the target value, wherein the target value is either of a speed of bending and a speed of rotating of the subject.

4. (Currently Amended) The controller ~~apparatus~~ according to claim 34 [[1]], wherein the input correction portion ~~control unit~~ determines first correction value and the second correction value ~~the control signal~~ by compensating the target value based on a predetermined parameter.

5. (Withdrawn) The apparatus according to claim 1, wherein

the control unit determines the control signal by compensating the target value based on a parameter, and

the control unit renews the parameter based on a state parameter of the hauling unit.

6. (Withdrawn) The apparatus according to claim 5, wherein the state parameter is a tension of the hauling unit.

7. (Withdrawn) The apparatus according to claim 1, wherein

the control unit determines the control signal by multiplying the target value by a variable gain, and

the control unit renews the variable gain based on a state parameter of the hauling unit.

8. (Withdrawn) The apparatus according to claim 7, wherein the state parameter is a tension of the hauling unit.

9. (Cancelled)

10. (Withdrawn) An apparatus for traction positional control comprising:

a hauling unit that hauls a subject to bend or rotate the subject;

an output unit that outputs an operation command value signal that corresponds to a target value that is input by an operating unit;

a feedforward control unit that compensates the operation command value signal based on a feedforward compensation value, and generates a feedforward control signal;

a drive control unit that generates a control signal based on the feedforward control signal; and

a driving unit that drives the hauling unit based on the control signal.

11. (Withdrawn) The apparatus according to claim 10, further comprising:

a drive detecting unit that detects a driving state of the driving unit; and

a first deviation calculating unit that calculates a first deviation between the feedforward control signal and a detecting signal detected by the drive detecting unit, wherein

the drive control unit generates the control signal in such a way that the first deviation is suppressed to zero.

12. (Withdrawn) The apparatus according to claim 10, further comprising:

a plurality of hauling units that are coupled to each other, and transmit a driving force from the driving unit in succession;

a relay drive detecting unit that detects a relay driving state when one of the hauling units receives the driving force from another hauling unit, and outputs a relay state signal;

a relay deviation calculating unit that calculates a deviation between the feedforward control signal and a detecting signal detected by the relay drive detecting unit; and

a relay control unit that suppresses the deviation to zero, wherein

the drive control unit generates the control signal based on a signal output from the relay control unit.

13. (Withdrawn) The apparatus according to claim 10, further comprising:

a hauling state detecting unit that detects a hauling state of the hauling unit, and outputs a hauling state detecting signal;

a second deviation calculating unit that calculates a second deviation between the operation command value signal and the hauling state detecting signal;

a feedback control unit that generates a feedback control signal to suppress the second deviation to zero; and

a signal generation unit that generates a compensation signal that is obtained by compensating the feedforward control signal using the feedback control signal, and outputs the compensation signal to the drive control unit.

14. (Withdrawn) The apparatus according to claim 13, wherein the hauling state detecting unit comprises

a tension detecting unit that detects a tension of the hauling unit;

a state estimating unit that estimates a state of the subject based on the operation command value signal and the tension; and

a dynamics changing unit that changes dynamics of the feedforward control unit and dynamics of the feedback control unit based on a result of the state estimating unit.

15. (Withdrawn) An apparatus for traction positional control comprising:

a hauling unit that hauls a subject to bend or rotate the subject;

an output unit that outputs an operation command value signal that corresponds to a target value that is input by an operating unit;

a feedforward control unit that compensates the operation command value signal based on a feedforward compensation value, and generates a feedforward control signal;

a drive control unit that generates a control signal based on the feedforward control signal;

a correction control unit that controls a variation amount of the control signal output in a predetermined range including a position of the hauling unit in a state before the

hauling unit hauls the subject to be greater than a variation amount of the control signal output outside the predetermined range; and

a driving unit that drives the hauling unit based on the control signal.

16. (Withdrawn) The apparatus according to claim 15, further comprising:

a hauling state detecting unit that detects a hauling state of the hauling unit, and outputs a hauling state detecting signal;

a deviation calculating unit that calculates a deviation between the operation command value signal and the hauling state detecting signal;

a feedback control unit that generates a feedback control signal to suppress the deviation to zero; and

a signal generation unit that generates a compensation signal that is obtained by compensating the feedforward control signal using the feedback control signal, and outputs the compensation signal to the drive control unit.

17. (Withdrawn) The apparatus according to claim 16, wherein the hauling state detecting unit comprises

a tension detecting unit that detects a tension of the hauling unit;

a state estimating unit that estimates a state of the subject based on the operation command value signal and the tension; and

a dynamics changing unit that changes dynamics of the feedforward control unit and dynamics of the feedback control unit based on a result of the state estimating unit.

18. (Withdrawn) The apparatus according to claim 15, wherein the correction control unit outputs the control signal based on the target value, wherein the target value is either of an amount of bending and an amount of rotating of the subject.

19. (Withdrawn) The apparatus according to claim 15, wherein the correction control unit outputs the control signal based on the target value, wherein the target value is either of a speed of bending and a speed of rotating of the subject.

20. (Withdrawn) The apparatus according to claim 15, wherein the correction control unit determines the control signal by compensating the target value based on a predetermined parameter.

21. (Withdrawn) The apparatus according to claim 15, wherein

the correction control unit determines the control signal by compensating the target value based on a parameter, and

the correction control unit renews the parameter based on a state parameter of the hauling unit.

22. (Withdrawn) The apparatus according to claim 15, wherein the state parameter is a tension of the hauling unit.

23. (Withdrawn) The apparatus according to claim 15, wherein

the correction control unit determines the control signal by multiplying the target value by a variable gain, and

the correction control unit renews the variable gain based on a state parameter of the hauling unit.

24. (Withdrawn) The apparatus according to claim 23, wherein the state parameter is a tension of the hauling unit.

25. (Withdrawn) The apparatus according to claim 1, wherein the hauling unit is a wire.

26. (Withdrawn) The apparatus according to claim 1, wherein the operating unit is a joystick.

27. (Withdrawn) The apparatus according to claim 1, wherein the driving unit is a motor.

28. (Currently Amended) The controller ~~apparatus~~ according to claim 4, wherein the predetermined parameter is set manually in accordance with degree of extension of the hauling unit.

29. (Currently Amended) The controller ~~apparatus~~ according to claim 34 [[1]], further comprising:

a notch filter through which the control signal ~~output from the control unit~~ passes to gradually change a differential value of the control signal with respect to the target value near a lower limit and an upper limit of ~~boundary between inside~~ the predetermined range ~~and outside the predetermined range, and output the control signal to the driving unit~~.

30. (Currently Amended) The controller ~~apparatus~~ according to claim 34[[1]], further comprising:

a low pass filter through which the control signal ~~output from the control unit~~ passes to gradually change a differential value of the first control input signal with respect to the target value near a lower limit and an upper limit of the predetermined range ~~boundary between inside the predetermined range and outside the predetermined range, and output the control signal to the driving unit~~.

31. (Cancelled)

32. (Currently Amended) The controller ~~apparatus~~ according to claim 37[[1]], wherein the operating unit is a joystick.

33. (Currently Amended) The controller ~~apparatus~~ according to claim 34[[1]], wherein the driving unit is a motor.

34. (New) controller for controlling a driving unit for effecting a movement of an actuator mechanism through a hauling unit including a wire wound around the driving unit, wherein both ends of the wire are connected to the actuator mechanism, the controller comprising:

a control portion for generating and outputting a driving unit control signal for controlling the driving unit based at least upon one of a first control input signal and a second control input signal; and

an input correction portion for converting a externally-supplied target value into a first correction value by a linear converting operation, wherein a first characteristic curve defined by the first correction value is defined by a first predetermined slope if the received target value is outside a predetermined range within which is indicative of a state wherein both ends of the wire connected to the actuator mechanism are loose, wherein the input correction portion converts the received target value into a second correction value by a proportional converting operation, wherein a second characteristic curve defined by the second correction value is defined by a second predetermined slope that is greater than the first determined slope if the received target value is within the predetermined range, and wherein the first correction value and the second correction value are supplied by the control portion as the first control input signal and the second control input signal, by which the control portion generates and outputs the driving unit control signal to drive the driving unit such that the target value is outside the predetermined range.

35. (New) The controller as set forth in claim 34, wherein the control portion comprises a feedback control portion that generates the driving unit control signal in response to the first and second control input signals, and in response to a rotation position signal indicative of a rotation position of a rotation axis of a motor comprising the driving unit.

36. (New) The controller as set forth in claim 34, wherein the second predetermined slope for the second characteristic curve is defined by a constant "α," wherein α is a real number greater than one, and wherein the first predetermined slope for the first characteristic curve is defined by a constant "α-1."

37. (New) A motorized endoscope, comprising:

a distal end bending section constructed with bending capability;

a motor for effecting a movement of the distal bending section in a first direction, the motor including an actuator;

a hauling unit, the hauling unit comprising:

a pulley fixed to a rotation axis of the motor, wherein a wire

comprising a first and a second end is wrapped around the pulley, and wherein the

first and second ends are connected to the actuator;

two wire sheaths arranged for protecting separate wire portions that are positioned between the motor and the distal bending section;

an operating unit constructed to operate to generate and output a first target value in response to a user input; and

a controller for controlling motor rotation, the controller comprising:

a first motor control portion that generates and outputs a first motor control signal based at least in part on a control input signal;

an input correction portion for converting the first target value into a first correction value by a linear converting operation, wherein a first characteristic curve defined by the first correction value is defined by a first predetermined slope if the received target value is outside a predetermined range within which is indicative of a state wherein both ends of the wire connected to the actuator mechanism are loose, wherein the input correction portion converts the received target value into a second correction value by a proportional converting operation, wherein a second characteristic curve defined by the second correction value is defined by a second predetermined slope that is greater than the first determined slope if the received target value is within the predetermined range, and wherein the first correction value and the second correction value are supplied by the control portion as the control input signal by which the control portion generates and outputs the driving unit control signal to drive the driving unit such that the target value is outside the predetermined range.

38. (New) The endoscope as set forth in claim 37, wherein the control portion comprises a feedback control portion that generates the driving unit control signal in response to the control input signal, and in response to a rotation position signal indicative of a rotation position of a rotation axis of the motor.

39. (New) The endoscope as set forth in claim 37, further comprising:

a second motor and a second hauling unit for effecting a movement of the distal bending section in a second direction that is substantially orthogonal to movement in the first direction, wherein said operating unit comprises a portion for outputting a second target value corresponding to the second direction; and

wherein the controller further comprises a second input correction portion and a second motor control portion, which second input correction portion and second motor control portion to process the second target value.